REMARKS

Reexamination and reconsideration is respectfully requested in light of the foregoing amendments to the claims and following remarks.

Claims 1-10 and 12-17 are pending in this application. Claim 11 was canceled by a previous amendment. No new claims have been added. Claims 1, 4 and 5 have been amended. Support for the amendments can be found in claim 3 and at page 16, line 4 to page 17, line 17, page 18, lines 8-25.

Applicant notes the Examiner's acceptance of the drawings file September 2, 2004. Applicant further notes the Examiner's consideration of the art cited in the Information Disclosure Statements filed September 2, 2004, April 15, 2005 and March 17, 2006, as acknowledged in the Office Action Summary.

Rejection Under 35 U.S.C. § 112

Claim 5 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite in that the term "reducing agent" does not have antecedent basis. Claim 5 has been amended to be dependent on claim 4. By this amendment, the rejection is believe to be overcome. It is respectfully requested that the rejection be reconsidered and withdrawn.

Rejection Under 35 U.S.C. § 103

Claims 1-7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Nokai et al. (JP 2000-124662) and Kang et al. et al. (JP Published Application No. 08-273431). According to the Examiner, Nokai et al. teach a conductive paste having a straight "chain-like

floc" of two or more metals and that the metals include Au, Pt, Ag, Cu Ru, Rh, Ir and Os.[1] While the Examiner points out the particle diameter, the length and diameter of the chain are not disclosed by Noaki et al. The Examiner takes the position that L/D ratio is merely optimization obtained by routine experimentation to get optimal results. The Examiner also conceded that the reference fails to disclose that the particles as having ferromagnetic properties. For this deficiency the Examiner relies on Kang et al. which discloses a conductive paste containing nickel particles which the Examiner finds exhibits ferromagnetic properties. From these findings, the Examiner concludes that it would have been obvious to substitute nickel for the metals disclosed in Noaki et al. As for the orientation of the particles in the thickness direction of the film, this too the Examiner asserts would have been obvious to a person having ordinary skill in the art in that one possible way to orient the particles is in the thickness direction of the film. Further, the Examiner acknowledges that neither Noaki et al. nor Kang et al. disclose the use of trivalent titanium reducing agent. For this deficiency, the Examiner relies on the holding in *In re Best*, 562 F. 2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977); *In re Spada*, 911 F. 2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990); and *Titanium Metals Corp. v. Banner*, 778 F. 2d 775, 227 USPQ 773 (Fed. Cir. 1985). Applicant respectfully traverses the rejection.

Naoki et al. disclose a transparent conductive film having a conductive film formed by applying a paint in which chain-shaped aggregates of fine metal particles are dispersed. The chain-shaped aggregate is produced in the following methods. In the case of producing a metal hydrosol, an aqueous solution of a metal salt is prepared and is adjusted to a pH of 5 to 7. A

[1] In the Office Action on page 2, The Examiner gave a web site: http:/www.minerals.net/resources/property/-magnetic.htm, but the undersigned could not find this web site using a Google search.

reducing agent having a mol equivalent 0.5 to 3 times to the metal ions is added to the solution to form a fine metal particle dispersion. The dispersion is maintained at a temperature in a range of not lower than 40°C and not higher than a boiling temperature of a dispersion medium for a period of time before an organic compound, such as alcohol, is added to control polarity of a dispersion medium. The chain-shaped aggregate thus obtained is only an aggregate that fine metal particles are simply aggregated in a chain shape. See paragraphs [0012] to [0013] of Naoki et al.

With respect to the chain-shaped aggregate, the chain of the fine metal particles can be very easily broken up by application of external force such as when the paint is mixed and applied. Furthermore, when the aggregation conditions are not satisfied, such as in the case where the pH of the paint is changed, each of the fine metal particle may segregate individually. For that reason, there are only a few fine metal particles in the conductive film formed by applying the paint that maintain a state of chain-shaped aggregation. As a lot of other fine metal particles exist in a state of segregation in the conductive film, this does not contribute to improving conductivity.

On the other hand, claim 1 as amended requires the metal powder to include a metal having ferromagnetism being linked in a chain shape by magnetism. Since each of the metal particles in the chain is firmly linked by magnetism, the chain cannot be easily broken up by application of external force. Furthermore, even when the chain of the metal particles is broken up, the particles are reconnected due to the magnetism. As a result, the metal particles maintain

themselves in a chain shape in a formed anisotropic conductive film, which contributes to improving conductivity.

Kang et al. do not make up for the deficiency of Noaki et al. Kang et al. disclose a paste in which a dendrite powder is coated with a coating material. The coated particles are added to a polymer material. However, the dendrite is formed to precipitate copper or the like dendriticlly by electrodeposition. The dendrite powder is not in a chain shape, i.e., fine metal particles including a metal having ferromagnetism being linked in a chain shape by magnetism as required by claim 1.

Moreover, why would a person having ordinary skill in the art select a ferromagnetic Ni from the list of metals disclosed by Kang et al. as a substitute for one of the metals in Noaki's paint. The suggestion could only have come from Applicant's disclosure. It is well established that the Examiner has the initial burden of demonstrating that the teachings of the cited prior art would have suggested to those of ordinary skill that should make the claimed composition, and that such persons would have a reasonable expectation of success. *In re O'Farrell*, 853 F.2d 894, 7 USPQ2d 1673 (Fed. Cir. 1988). This suggestion must be in the prior art, and not in the applicant's disclosure. *In re Dow Chemical Co.*, 837 F.2d 469, 5 USPQ2d 1529 (Fed. Cir. 1988).

The Examiner asserts that the substitution would be obvious because of the "recognized equivalents of the sets of particles and that both sets of metal particles are used in "conductive paste/electronic part applications" and that both sets are taken from the same groups in the Periodic Table and "can be expected to have similar properties." The Noaki et al. lists includes Au, Pt, Ag, Cu Ru, Rh, Ir and Os particles. Kang et al.'s dentritic powder consists of a metal

selected from the group consisting of Cu, Ni, Co, Cr, Pd and Pt. The only ferromagnetic material in both lists is Ni. Why select Ni? The reasons offered by the Examiner would not have led a person having ordinary skill in the art to select Ni. The invention in Noaki et al. is directed to a conductive coating that has an antistatic and electromagnetic wave shielding effect for use in a CRT and plasma display. Because of the ferroelectric properties of Ni asserted by the Examiner, why would such a person select Ni from Kang et al.'s list for electromagnetic wave shielding. The use of Ni would appear in Noaki et al. would appear to render Noaki's invention inoperable. Therefore, there would appear to be no motivation to make the substitution suggested by the Examiner.

As for the L/D limitation, optimization of a variable which is recognized in the prior art to be a result effective variable would ordinarily have been within the skill in the art. *In re Boesch*, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980). The Examiner has not established that the ratio is a result effective variable known to persons skilled in the art.[2]

The Examiner's conclusion with respect to the orientation feature of the invention, i.e., orientation of the particles in the thickness direction, is nothing more than a conclusion. The reasoning that the direction is possible is not adequate. There is no cogent scientific reasoning presented by the Examiner from the teachings of the references to show how a person having ordinary skill in the art would have arrived at the claimed feature of the invention from the teachings of the applied prior art.

[2] In the rejection, the Examiner's makes reference to Lin et al. The cite to Lin et al. is not understood.

Finally, the Examiner concedes that neither reference relied upon discloses the use of trivalent titanium compound as a reducing agent to reduce metal ions to a metal as required by claim 4. For reasons stated *supra*, the Examiner has not established that the combined teachings of Noaki et al. and Kang et al. suggest a product which is similar or identical to the product which is claimed. Accordingly, the holdings of *In re Best*, *In re Spada* and *Titanium Metals Corp. v. Banner*, *supra*, do not apply.

For all of the foregoing reasons, the Examiner has not established a *prima facie* case of obviousness in the rejection of claims 1-7 over Noaki et al. and Kang et al.. It is respectfully requested that the rejection be reconsidered and withdrawn.

Rejection Under 35 U.S.C. §§ 102/103

Claims 1-17 stand rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as being unpatentable over Jin et al. (U.S. Patent No. 4,923,739). According to the Examiner, Jin et al. discloses an electrical interconnection medium comprising a composite of electrically conducting magnetic particles of Ni, Co, Fe and alloys thereof that are magnetically aligned. The Examiner finds that the reference discloses coating the particles with Cu and that the particle diameters range from 0.5 to 10 μm and the particle concentration range is from 0.5 to 30% by volume of the composition. The Examiner concedes that Jin et al. do not disclose the claimed L/D ratio, but continues to assert that this feature of the invention represents optimization. The Examiner further concedes that the reference does not disclose the use of a trivalent titanium reducing agent, but continues to rely on the holdings of *In*

re Best, *In re Spada* and *Titanium Metals Corp. v. Banner* to establish anticipation and obviousness. The rejection is respectfully traversed.

Jin et al. describe a composite electrical interconnection medium comprising a huge chain for forming a conductive network. The medium comprised spherical particles having a composite structure, of which a portion has magnetic properties. The surface portion of the particles is electrically conductive. The particles are dispersed as a row in a matrix material made of a hardened material such as an epoxy resin or the like. The reference also includes a teaching of the method for producing the medium which requires mixing the spherical particles and a liquid hardening resin, apply the mixture in a layer, applying a magnetic field in the thickness direction thereof, and hardening the hardening resin such that the particles are tied in a row to secure the chain.

Example 2 of Jin et al. describes a film having a thickness of approximately 250 μm formed by (i) forming a mixture comprising gold-coated nickel particles having an approximate diameter of 40 μm (second particles), nickel particles having an approximate diameter of 2 μm (first particles), and a silicone elastomer, (ii) forming film of said mixture, (iii) applying a magnetic field sequentially to a x-direction and a z-direction of the film, and (iv) thermally curing the silicone elastomer such that the resulting film has a resistance of 0.3-2Ω, a insulating resistance $10^7\Omega$ and an anisotropic property.

The second particles in Jin et al. have a large particle size (10 to 100μm in diameter). The particles are aligned in the z-direction of the film by the magnetic field to secure a high conductivity in the z-direction. Since the conductivity in the Z-direction cannot be obtained only

with the first particles of a small particle size such as 0.5 to 10μm, it is not able to cope with narrowing the pitch of the electrodes.

On the other hand, while securing a high conductivity in the thickness direction thereof (z-direction), the present invention is able to cope with narrowing the pitch of the electrodes by containing a lot of metal particles having a form linked in a chain shape in the film. Since the spherical particles in Jin et al. are mixed with a binder and the mixture is deposited in the form of a film with subsequent application of a magnetic filed and curing of the binder to form the particles linked in a chain form, the binder is intervened among the particles. Therefore, the smaller the particles are, the more binder is intervened. This results in a deterioration of conductivity.

As for the L/D limitation, optimization of a variable which is recognized in the prior art to be a result effective variable would ordinarily have been within the skill in the art. *In re Boesch*, *supra*. The Examiner has not established that the ratio is a result effective variable known to persons skilled in the art. Moreover, the Examiner's reference to Lin et al. in making this rejection is not understood.

The Examiner concedes that neither reference relied upon discloses the use of trivalent titanium compound as a reducing agent to reduce metal ions to a metal as required by claim 4. For reasons stated *supra*, the Examiner has not established that the combined teachings of Noaki et al. and Kang et al. suggest a product which is similar or identical to the product which is claimed. Accordingly, the holdings of *In re Best*, *In re Spada* and *Titanium Metals Corp. v. Banner* do not apply.

For all of the foregoing reasons, the Examiner has not established a *prima facie* case of anticipation or obviousness in the rejection of claims 1-17 over Jin et al. It is respectfully requested that the rejection be reconsidered and withdrawn.

Conclusion

It is submitted that the claims 1-17 are patentable over the teachings of the prior art relied upon by the Examiner. Accordingly, favorable reconsideration of the claims is requested in light of the preceding amendments and remarks. Allowance of the claims is courteously solicited.

If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, the Examiner is requested to call Applicants' attorney at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due under 37 C.F.R. § 1.17 and due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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